1888MNRAS..48..360C

Note on the visible Spectrum of the Great Nebula in Orion.
By Ralph Copeland, Ph.D.

When examined with a sufficiently powerful spectroscope provided with a slit, the light of the Great Nebula is chiefly separated into the three well-known lines characteristic of most gaseous nebulæ. There is also a fourth line, which is generally admitted to coincide in place with the third great line of the hydrogen spectrum. Towards the end of 1886, however, when the nebula was first studied at Dun Echt with an exceptionally suitable spectroscope, a long stretch of continuous spectrum was detected, embracing the three brighter lines and terminating somewhat abruptly a little above D, in W.L. 570, or thereabouts. In the dark space below this a faint but apparently well-defined line was discovered on December 28, 1886. The first measures, made two days later, indicated that its light was slightly more refrangible than that of the D-lines. It was therefore naturally thought that the line would turn out to be identical with D_3, a supposition which further observations strongly confirmed. The mean wave-length derived from over thirty measures is 587·4, or only 0·1 less than Vogel's position of D_3. The occurrence of this line in the spectrum of a nebula is of great interest as affording another connecting link between gaseous nebulæ and the Sun and stars with bright line spectra, especially with that remarkable class of stars of which the first examples were detected by MM. Wolf and Rayet in the constellation of *Cygnus*.

On January 23, 1887, it was believed that traces of an exceedingly faint line could be made out about W.L. 448. If a line of this refrangibility exists, it can probably be photographed more easily than seen.

The following table and diagram show the results of the measures and the general appearance of the spectrum.

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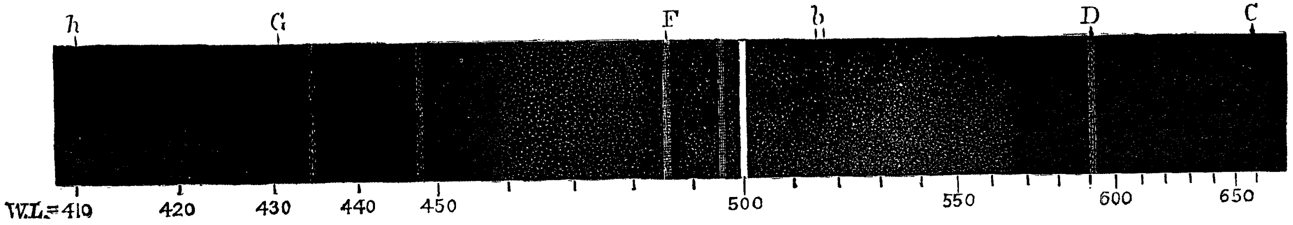
Great Nebula in Orion.

	Line (5)	Meas.	(1)	Meas.	(2)	Meas.	(3)	Meas.	eF	Meas.	(4)	Meas.	Continuous Spectrum.
1886, Dec. 28	...	...	500·7	2	495·8	2	...	...	...	...	434·8	2	
30	585·5	5	...	...	...	...	...	...	...	...	...	...	
1887, Jan. 20	...	...	500·3	2	495·7	2	486·1	3	...	...	434·0	2	Begins 566·2; ends 456·1
23	588·0	8	500·3	1	496·0	1	486·1	2	447·6	1	433·9	3	Begins 564·7.
Feb. 18	589·2	10	...	...	...	...	...	...	...	...	...	...	
Mar. 19	586·9	10	...	...	...	...	...	...	...	...	...	...	
24	...	...	...	...	...	...	...	...	...	...	...	...	Begins 572.0; max. 527·5; ends 462·6
	587·4		500·4		495·8		486·1		447·6		434·2		Begins 567·6 Max. 527·5 Ends 459·4

D. Vogel.	D'Arrest's Mean Values.				Watts.
587·5	500·4	495·7	486·1	...	434·0



Visible Spectrum of the Great Nebula in Orion.

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In conclusion it may be mentioned that on many favourable occasions the spectroscope was carefully adjusted for C, but no trace of that line could be detected in the light of the Great Nebula. On the other hand, the continuous spectrum shows some indications of resolvability into lines or bands.

Lord Crawford's Observatory, Dun Echt:
1888, *June* 2.

Physical Observations of Saturn in 1888.
By Thomas Gwyn Elger.

In continuation of the paper presented at the June meeting last year, I submit the following observations of the planet made with an $8\frac{1}{2}$-inch silver-on-glass reflector by Calver during the months of January, February, March, and April this year, premising that, though the weather generally was not so favourable for the scrutiny of delicate detail as during the spring of 1887, on some four or five nights the atmospheric conditions were especially excellent, and on several occasions, when they were less propitious, spells of very good vision, of longer or shorter duration, were obtained. Eyepieces magnifying 284, 340, and 420 times were employed—the second being found most usually serviceable, though the highest afforded superb views of the planet on suitable nights.

Ring A.—The colour of this ring always appeared on the best observing nights to be lavender-grey, its uniformity and depth of tone, however, varying within wide limits. On some occasions it was either wholly or partially divided, about midway between the outer and inner edge, into two zones—an outer dark zone and an inner light zone, the latter being sometimes evidently the narrower. On March 5, $7^h\ 35^m$ to $9^h\ 0^m$, with superb vision, affording long steady views with powers 340 and 420, the contrast in the shading was very marked, the southern portion from the extremities of both ansæ up to the ball being very much darker than that on the northern half of the ring. On March 21, $9^h\ 15^m$ to $10^h\ 10^m$, it was clearly darker on the *p.* ansa, as was also the case on March 27, $8^h\ 15^m$ to $8^h\ 50^m$. On inferior nights a ruddy or salmon hue was frequently noted in connection with this ring—an appearance which was probably due to atmospheric causes. *Divisions.*—Though a faint, delicate, dark line, presumably Encke's division, was frequently observed last year, even on indifferent nights, not a trace of any dark division was seen this season, except on March 6, 8^h to 9^h, and on March 21. On the former date a faint dark line was glimpsed on the *s. f.* side, and on the latter, between $9^h\ 15^m$ and $10^h\ 10^m$ a similar feature was seen on the *p.* ansa, at a distance of about one-third the width of the ring from its outer edge. A narrow light streak (as was